

Dell EMC PowerEdge R840

Technical Guide

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System overview

Introduction

The Dell EMC PowerEdge R840 is 4 socket, 2U rack server designed to run complex workloads using highly scalable memory, I/O, and network options. The system features the Intel Xeon Scalable Processor family, up to 48 DIMMs, PCI Express 3.0 enabled expansion slots, and a choice of network interface technologies for rNDC. The PowerEdge R840 is a general purpose platform capable of handling demanding workloads and applications, such as data analytics, data warehouses, ecommerce, databases, CPU virtualization, and high-performance computing.

The R840 features:

- 2nd Generation Intel Xeon Scalable Processor product family—with up to 28 cores and two threads per core
- Up to 24 channels with 6 channels per CPU and up to 48 DIMMs with 2 DIMMs per channel
- Scale capacity and performance with up to 26 2.5 inch HDDs and SSDs
- Accelerate applications with up to 2 double-width GPUs or up to 2 full-height FPGAs
- Speed data transfers with a fully integrated ultra-path interconnect across all four sockets

New technologies

The following are the new technologies featured on the PowerEdge R840:

Table 1. New technologies

New technology	Detailed description
2nd Generation Intel Xeon Scalable Processor	The processor product family has embedded PCIe lanes for improved I/O performance. For details, see the Processor section.
Intel C620 series chipset	The R840 system uses the Intel C620 chip. It is a 2 chip platform - CPU and PCH.
2933 MT/s DDR4 memory	<p>The 2nd Generation Intel Xeon Scalable Processor product family that supports up to 2933 MT/s memory and forty eight DIMMs.</p> <p>The R840 system supports:</p> <ul style="list-style-type: none"> • Two DIMMs per channel for single-rank and/or dual-rank DIMMs <p>For details, see the Memory section.</p>
Intel Optane DC persistent memory (DCPMM)	<p>A new class of memory with same DDR4 electrical & physical constraints and close to DRAM latency</p> <ul style="list-style-type: none"> • Up to 6 per CPU socket. Max 24 for 4S configuration. • 256GB, 512GB per DIMM • 1866, 2133, 2400, 2666 MT/s • Up to 12.28TB max, (15.36TB max with DCPMM and LDRIMM)
iDRAC9 with Lifecycle Controller	<p>The new embedded systems management solution for the Dell EMC systems features hardware and firmware inventory and alerting, data center level power monitoring, and faster performance.</p> <p>For details, see the Dell EMC OpenManage systems management section.</p>
2.5-inch PCIe SSD	Supports up to twenty four direct-attached PCIe SSD NVMeS
PERC S140	This new software RAID solution supports:

New technology

Detailed description

- RAID 0, 1, 5, and Non-RAID
- SATA HDD and SSD devices only
- Up to twenty four 2.5 inch hot-plug SATA HDDs or SSDs
- Software RAID is through the Intel C620 chipset
- Software RAID solution is supported on Linux and Windows

For details, see the Storage section.

LCD bezel

The PowerEdge R840 LCD control panel is embedded in an optional front bezel for easy access and management.

Wireless Management

The Quick Sync 2 BLE/Wi-Fi module offers support for access to the iDRAC GUI, SupportAssist Collections, remote RACADM, and VNC remote console connectivity.

System features

The R840 system is a 2U 4-socket rack server. It features the 2nd Generation Intel® Xeon® Processor scalable family processors (up to 28 cores and 2 threads per core) and 48 DIMMs (supports DDR4 RDIMM/LRDIMM/NVDIMM-N/DCPMM.)

The R840 system has the following features:

- High-performance memory density with balanced I/O
- Balanced combination of processing density, high memory capacity, low power consumption, and value
- Easy life cycle manageability with innovative management tools
- Ideal for space constrained data centers

Topics:

- [Product comparison](#)
- [Technical specifications](#)

Product comparison

Table 2. Feature comparison

Feature	PowerEdge R840	PowerEdge R830
CPU	4x 2nd Generation Intel Xeon Processor Scalable Family Gold & Platinum	4x Intel Xeon E5-4600 v4
Intel Ultra Path Interconnect (UPI)	Intel Ultra Path Interconnect (UPI)	Intel QuickPath Interconnect (QPI)
Memory	48 x DDR4 DIMM slots (only up to 12 NVDIMM or 24 DCPMM slots) <ul style="list-style-type: none"> • RDIMM 3 TB • LRDIMM 6 TB • NVDIMM 384 GB • DCPMM 12.28 TB (15.36 TB with LRDIMM) 	48x DDR4 RDIMM, LRDIMM
Disk Drives	2.5 inch 12 Gb SAS, 6 Gb SATA	2.5 inch 12 Gb SAS, 6 Gb SATA
RAID controllers	Adapters: HBA330, H330, H730P, H740P, 12G SAS HBA, H840(ext) SW RAID: S140	Adapters: HBA330, H330, H730, H730P, H830 (ext)
PCIe SSD	Up to 24x direct-attached PCIe SSD	N/A
PCIe Slots	Max 6 PCIe 3.0 on R840 and	Max 7 PCIe 3.0
rNDC	4x 1 GB, 4x 10 GB, 2x 10 GB+2x 1 GB, or 2x 25 GB	4x 1 GB, 4x 10 GB, or 2x 10 GB+2x 1 GB
USB Ports	Front: 2 ports (USB 2.0), 1 managed (micro-USB) Rear: 2 ports (USB 3.0) Internal: 1 port (USB 3.0) Optional: 1 Front port (USB 3.0) - available only on X8 backplane configuration	1 PCH (USB2.0), 1 Managed, 1 Internal (USB3.0), 2 Rear (USB3.0, USB2.0)
Rack Height	2U	2U
Power Supplies	<ul style="list-style-type: none"> • AC (Platinum): 750 W, 1100 W, 1600 W, 2000 W, 2400 W • Mix Mode: 750 W PSU (DC input for China only) 	AC: 750 W, 1100 W, 1600 W DC: 1100 W

Feature	PowerEdge R840	PowerEdge R830
	<ul style="list-style-type: none"> AC (Titanium): 750 W DC: 1100 W Mix Mode/HVDC: 750 W (for China only), 1100 W 	
System Management	Lifecycle Controller 3.x, OpenManage, QuickSync 2.0, OMPC3, Digital License Key, iDRAC Direct (dedicated micro-USB port), Easy Restore, vFlash	Lifecycle Controller 3.x, OpenManage, QuickSync 1.0, PM3, Digital License Key, iDRAC, iDRAC Direct (dedicated micro-USB port), Easy Restore, vFlash
Internal GPU and FPGA	Up to 2x 300 W GPUs or up to 2 FH Double-width FPGAs	N/A
Availability	Hot-plug Redundant Cooling Hot-plug Drives Hot-plug Redundant Power Supplies Boot Optimized Storage Subsystem (BOSS) IDSDM	Hot-plug Drives Hot-plug Redundant Cooling Hot-plug Redundant Power Supplies IDSDM

Technical specifications

Table 3. Technical specifications

Feature	PowerEdge R840 technical specification
Form factor	2U rack
Processor	2nd Generation Intel Xeon Scalable Processor family
Processor sockets	4 sockets
Internal interconnect	Up to 3 Intel Ultra Path Interconnect (Intel® UPI)
Chipset	Intel C620 series Chipset
Memory	48 x DDR4 DIMM slots (only up to 12 NVDIMM or 24 DCPMM slots) <ul style="list-style-type: none"> RDIMM 3 TB LRDIMM 6 TB NVDIMM 384 GB DCPMM 12.28 TB (15.36 TB with LRDIMM)
I/O slots	Up to 6 x PCIe Gen 3 slots
RAID controller	Internal controllers: S140, HBA 330, PERC H330P, PERC H730P, PERC H740P External controllers (RAID): H840, 12 Gbps SAS HBA
Internal boot	Boot Optimized Storage Subsystem (BOSS): HWRAID 2 x M.2 SSDs 240GB, 480 GB Internal Dual SD Module
Hard drives	<ul style="list-style-type: none"> 8 x 2.5 inch SAS/SATA drives 24 x 2.5 inch SAS/SATA/NVMe drives 24 x 2.5 inch SAS/SATA/NVMe drives + 2 x 2.5 inch rear SAS/SATA
Embedded NIC	<ul style="list-style-type: none"> 4 x 1 GB 4 x 10 GB 2 x 10 GB + 2 x 1 GB 2 x 25 GB

Feature	PowerEdge R840 technical specification
Power supply	<p>Two back accessible hot pluggable PSUs</p> <ul style="list-style-type: none"> • 750 W AC PSU • 750 W Mix Mode HVDC PSU (for China only) • 750 W Mix Mode DC PSU (for China only) • 1100 W AC PSU • 1100 W DC PSU • 1100 W Mix Mode HVDC PSU (for Japan and China only) • 1600 W AC PSU • 2000 W AC PSU • 2400 W AC PSU
Supported operating systems	<ul style="list-style-type: none"> • Canonical Ubuntu® LTS • Citrix Hypervisor • Microsoft Windows Server LTSC with Hyper-V • Red Hat Enterprise Linux • Oracle Linux • SUSE Linux Enterprise Server • VMware ESXi <p>For more information on the specific versions and additions, visit Dell.com/OSsupport.</p>
Systems management	<p>Dell EMC Systems management consoles and tools:</p> <ul style="list-style-type: none"> • OpenManage Enterprise • OpenManage Mobile 2.0 • OpenManage Power Manager <p>iDRAC License options:</p> <ul style="list-style-type: none"> • iDRAC9 • iDRAC RESTful API with Redfish • iDRAC Direct • Quick Sync 2 BLE/wireless module <p>Dell EMC OpenManage Integrations:</p> <ul style="list-style-type: none"> • BMC Truesight • Microsoft System Center • RedHat Ansible Modules • VMware vCenter <p>Dell EMC OpenManage Connections:</p> <ul style="list-style-type: none"> • IBM Tivoli Netcool/OMNIBus • IBM Tivoli Network Manager IP Edition • Micro Focus Operations Manager I • Nagios Core • Nagios XI
Dimensions and weight	<ul style="list-style-type: none"> • Weight: 36.6kg with all 2.5 inch drives • Height: 86 mm — 3.3 inches • Width: 482.0 mm — 18.97 inches • Depth with bezel: <ul style="list-style-type: none"> • Front bezel to rear PSU handle: 879.84 mm (34.64 inches) • Front bezel to rear wall: 939.84 mm (37 inches) • Depth without bezel: <ul style="list-style-type: none"> • Front bezel to rear PSU handle: 842 mm (33.14 inches) • Front bezel to rear wall: 902 mm (35.51 inches)

Feature**PowerEdge R840 technical specification**

Recommended support

ProSupport Plus for critical systems or ProSupport for comprehensive hardware and software support for your PowerEdge solution. Consulting and deployment offerings are also available.

Contact your Dell EMC representative for more information. Availability and terms of Dell EMC Services vary by region. For more information, visit www.Dell.com/ServiceDescriptions.

Chassis views and features

The PowerEdge R840 is a four socket, 2U rack system that is available in three different chassis configurations:

- Eight hard drive chassis
- Twenty four hard drives chassis
- Twenty four hard drives plus 2 rear drives chassis

Topics:

- [Front view of the system](#)
- [Rear view of the system](#)
- [Internal chassis view](#)
- [Security features](#)

Front view of the system

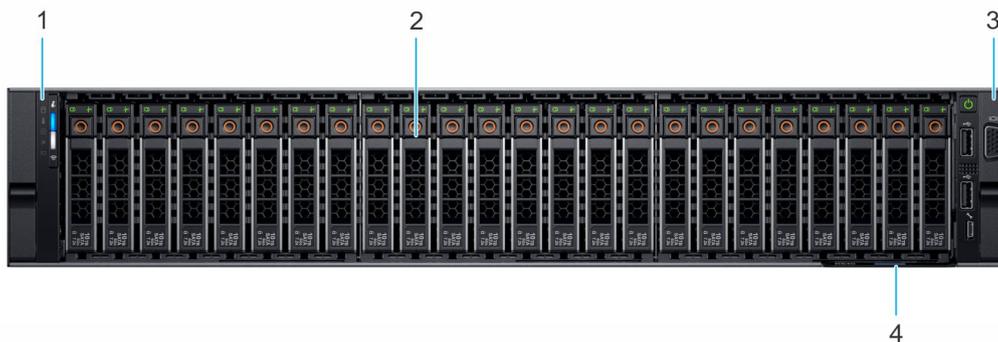


Figure 1. Front view 24 x 2.5-inch drive system

- | | |
|------------------------|----------------|
| 1. Left control panel | 2. Drives |
| 3. Right control panel | 4. Service Tag |

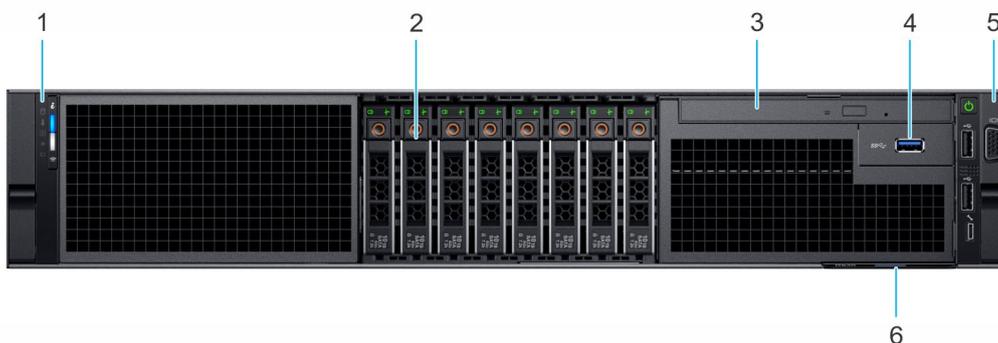


Figure 2. Front view 8 x 2.5-inch drive system

- | | |
|-----------------------------|----------------------------|
| 1. Left control panel | 2. Drive slots |
| 3. Optical drive (Optional) | 4. USB 3.0 port (Optional) |
| 5. Right control panel | 6. Service Tag |

Rear view of the system

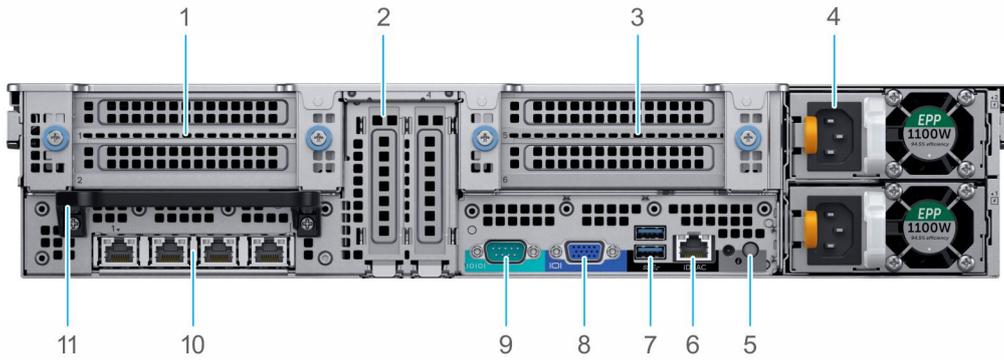


Figure 3. Rear view of the 24 x 2.5-inch drive system

- | | |
|---|---|
| 1. Riser 1 - Full-height PCIe expansion card (Slot 1 and 2) | 2. Half-height PCIe expansion card slots located on the system board (Slot 3 and 4) |
| 3. Riser 2 - Full-height PCIe expansion card slots (Slot 5 and 6) | 4. Power supply units (2) |
| 5. System identification button | 6. iDRAC9 dedicated port |
| 7. USB 3.0 ports (2) | 8. VGA port |
| 9. Serial port | 10. NIC ports (4) |
| 11. Rear handle | |

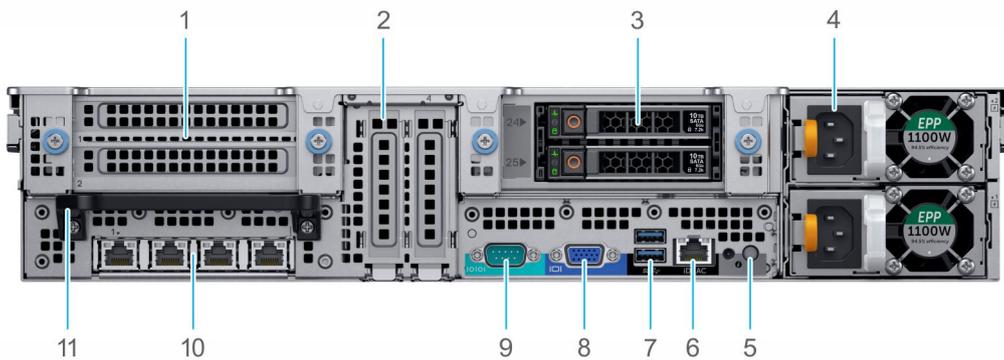


Figure 4. Rear view of the 24 x 2.5-inch + 2 x 2.5-inch (rear) drive system

- | | |
|---|---|
| 1. Riser 1 - Full-height PCIe expansion card slots (Slot 1 and 2) | 2. Half-height PCIe expansion card slots located on the system board (Slot 3 and 4) |
| 3. Rear drives (2) | 4. Power supply units (2) |
| 5. System identification button | 6. iDRAC9 dedicated port |
| 7. USB 3.0 ports (2) | 8. VGA port |
| 9. Serial port | 10. NIC ports (4) |
| 11. Rear handle | |

Internal chassis view

The chassis design of the PowerEdge R840 is optimized for easy access to components and for efficient cooling. The PowerEdge R840 supports up to 48 DIMMs, four processors, system board, rear drive cage, and many other components and features. For more system views, see the Dell EMC PowerEdge R840 Installation and Service Manual at Dell.com/Support/Manuals.

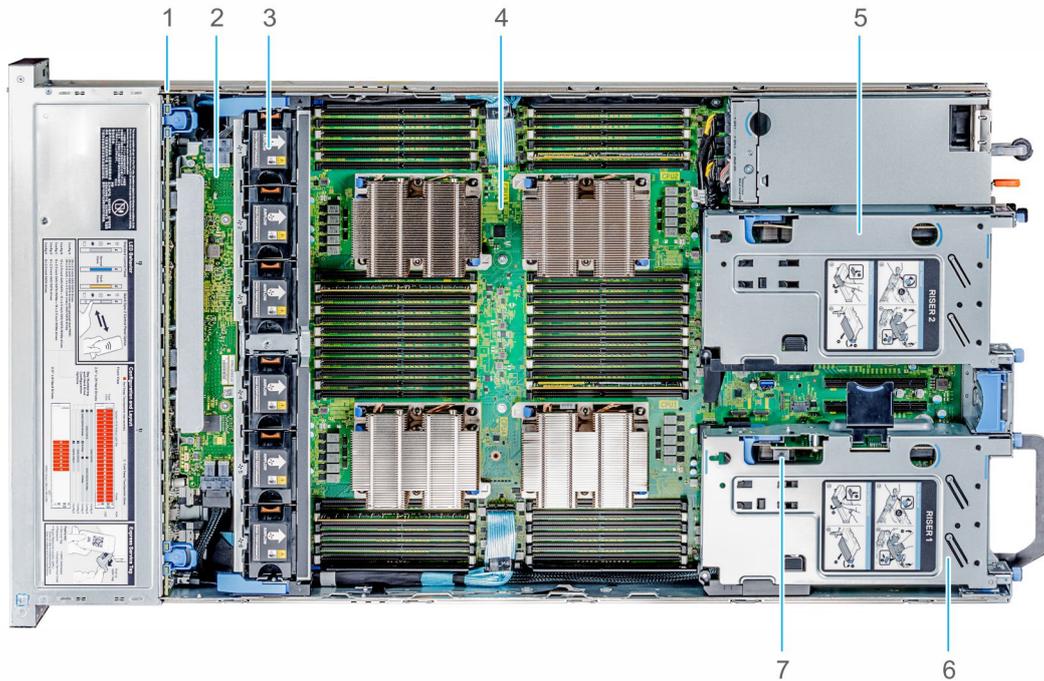


Figure 5. Internal chassis view without rear drive cage

- 1. Drive backplane
- 2. SAS Expander board
- 3. Cooling fans (6)
- 4. System board
- 5. Full-height expansion card Riser 2
- 6. Full-height expansion card Riser 1
- 7. Component on the right side of the chassis

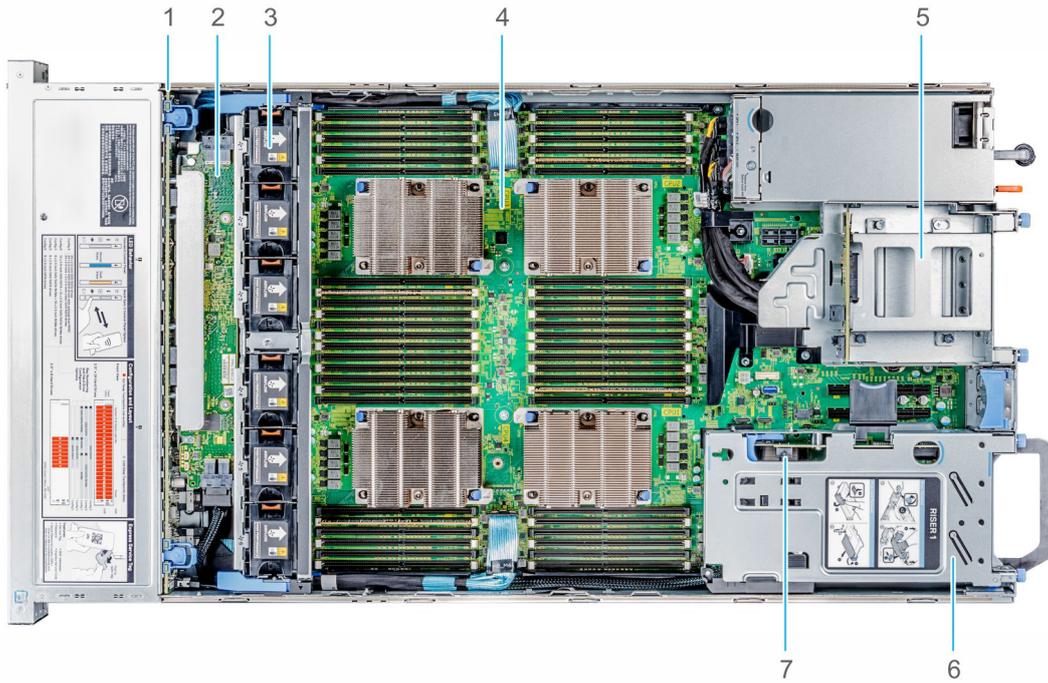


Figure 6. Internal chassis view with rear drive cage

- 1. Drive backplane
- 2. SAS Expander board
- 3. Cooling fans (6)
- 4. System board
- 5. Drive cage (rear)
- 6. Full-height expansion card Riser 1
- 7.

Security features

The latest generation of PowerEdge servers has the features listed in the table to help ensure the security of your data center.

Table 4. Security features

Security feature	Description
Cover latch	A tooled latch is integrated in the top cover to secure it to the system.
Bezel	A standard bezel is an optional metal bezel mounted to the chassis front. A lock on the bezel protects unauthorized access to hard drives. The Quick Sync NFC bezel enables the iDRAC QuickSync management function for managing the server from the front using an NFC-capable device and the free Dell EMC OpenManage Mobile App (currently Android only). Available only from the factory and not supported after point of sale.
TPM	The Trusted Platform Module (TPM) is used to generate/store keys, protect/authenticate passwords, and create/store digital certificates.
Power-off security	BIOS has the ability to disable the power button function.
Intrusion alert	An internal switch is used to detect chassis intrusion
Secure Boot mode	BIOS has the ability to enter a secure boot mode through system setup. This mode includes the option to lock out the power switches on the control panel or set up a system password.

Processors

The PowerEdge R840 server features the exceptional performance, value, and power efficiency of the 2nd Generation Intel Xeon Scalable Processor. These processors can provide high performance no matter what your constraint—floor space, power, or budget—and on workloads that range from the most complicated scientific exploration to crucial web-serving and infrastructure applications. In addition to providing raw performance gains, improved I/O is also made possible with Intel Integrated I/O, which can reduce latency by adding more lanes and doubling bandwidth. This helps to reduce network and storage bottlenecks, which improves the processor performance capabilities.

Topics:

- [Processor features](#)
- [Supported processors](#)
- [Chipset](#)

Processor features

The 2nd Generation Intel® Xeon® Processor Scalable Family provides the foundation for a powerful datacenter platform. The key features are as follows:

- Higher Per-Core Performance: Up to 28 cores, delivery high performance and scalability for compute-intensive workloads across compute, storage & network usages. 2nd Generation Intel® Xeon® Processors can offer even greater core or frequencies, or both.
- Large Memory Bandwidth/Capacity: 6 memory channels and up to 6 DCPMMs per socket of Intel® Optane™ DC persistent memory for data-centric workloads on select processors.
- AI capability: Intel® Deep Learning Boost drives inferencing for vector neural networks right in your CPU.
- Expanded I/O: 48 lanes of PCIe 3.0 bandwidth and throughput for demanding I/O-intensive workloads.
- Intel Ultra Path Interconnect (UPI): Up to three Intel UPI channels increase scalability of the platform to as many as eight sockets, as well as improves inter-CPU bandwidth for I/O intensive workloads.
- Intel Advanced Vector Extensions 512 (Intel AVX-512) with a single AVX512 fused multiply add (FMA) execution units. SKUs which support Advanced RAS enable a 2nd FMA execution unit.
- Security without Compromise: Near-zero encryption overhead enables higher performance on all secure data transactions with enhanced hardware mitigation.

Supported processors

Table 5. Supported processors for the PowerEdge R840

Intel SKU	SKU type	Stepping	Speed (GHz)	Cache (MB)	Cores	Max memory speed (MT/s)	TDP (W)
5122	Gold	XCC	3.6	16.5	4	2666	105
5115	Gold	XCC	2.4	14	10	2666	85
5117	Gold	XCC	2.0	19.25	14	2666	105
5118	Gold	XCC	2.3	16	12	2666	105
5120	Gold	XCC	2.2	14	12	2666	105
5222	Gold	XCC	3.8	16.5	4	2933	105
5220	Gold	XCC	2.2	24.75	18	2666	125
5218	Gold	XCC	2.3	22	16	2666	105
6126	Gold	XCC	2.6	19.25	12	2666	125
6132	Gold	XCC	2.6	19.25	14	2666	135
6130	Gold	XCC	2.1	22	16	2666	125

Intel SKU	SKU type	Stepping	Speed (GHz)	Cache (MB)	Cores	Max memory speed (MT/s)	TDP (W)
6142	Gold	XCC	2.6	22	16	2666	150
6138	Gold	XCC	2.0	27.5	20	2666	125
6136	Gold	XCC	3.0	24.75	12	2666	150
6140M	Gold	NA	2.3	1.5 TB	18	2666	140
6140	Gold	XCC	2.3	24.75	18	2666	140
6150	Gold	XCC	2.7	24.75	18	2666	165
6148	Gold	XCC	2.4	27.5	20	2666	150
6142M	Gold	NA	2.6	1.5 TB	16	2666	150
6154	Gold	XCC	3.0	24.75	18	2666	200
6134M	Gold	NA	3.2	24.75	8	2666	130
6134	Gold	XCC	3.2	24.75	8	2666	130
6128	Gold	NA	3.4	19.25 MB	6	2666	115
6152	Gold	XCC	2.1	30.25	22	2666	140
6144	Gold	NA	3.6	24.75 MB	8	2666	165
6146	Gold	NA	3.4	24.75 MB	12	2666	165
6262V	Gold	XCC	1.9	33	24	2400	135
6254	Gold	XCC	3.1	NA	18	2933	200
6252	Gold	XCC	2.1	NA	24	2933	150
6252N	Gold	XCC	2.3	1.49	24	2933	150
6248	Gold	XCC	2.5	27.5	20	2933	150
6246	Gold	XCC	3.6	24.75	12	2933	165
6244	Gold	XCC	3.7	24.75	8	2933	150
6242	Gold	XCC	2.8	22	16	2933	150
6240	Gold	XCC	2.6	24.75	18	2933	150
6240M	Gold	XCC	2.6	NA	18	2933	150
6240L	Gold	XCC	2.6	NA	18	2933	150
6238	Gold	XCC	2.1	30.25	22	2933	140
6238M	Gold	XCC	2.1	NA	22	2933	140
6238L	Gold	XCC	2.1	NA	22	2933	140
6234	Gold	XCC	3.3	24.75	8	2933	130
6230	Gold	XCC	2.1	NA	20	2933	125
6230N	Gold	NA	2.3*	NA	20	2933	125
6222V	Gold	XCC	1.8	27.5	20	2400	115
6226	Gold	XCC	2.7	19.25	12	2933	125
8160M	Platinum	NA	2.1	1.5 TB	24	2666	150
8160	Platinum	XCC	2.1	33	24	2666	150
8168	Platinum	XCC	2.7	33	24	2666	205
8170M	Platinum	NA	2.1	1.5 TB	26	2666	165
8170	Platinum	XCC	2.1	35.75	26	2666	165
8176M	Platinum	NA	2.1	NA	28	2666	165

Intel SKU	SKU type	Stepping	Speed (GHz)	Cache (MB)	Cores	Max memory speed (MT/s)	TDP (W)
8176	Platinum	XCC	2.1	38.5	28	2666	165
8180M	Platinum	NA	2.5	NA	28	2666	205
8180	Platinum	XCC	2.5	38.5	28	2666	205
8153	Platinum	XCC	2.0	NA	16	2666	125
8280L	Platinum	XCC	2.7	38.5	28	2933	205
8280M	Platinum	XCC	2.7	38.5	28	2933	205
8280	Platinum	XCC	2.7	38.5	28	2933	205
8276L	Platinum	XCC	2.2	NA	28	2933	165
8276M	Platinum	XCC	2.2	NA	28	2933	165
8276	Platinum	XCC	2.2	NA	28	2933	165
8270	Platinum	XCC	2.7	NA	26	2933	205
8268	Platinum	XCC	2.9	NA	24	2933	205
8260L	Platinum	XCC	2.4	NA	24	2933	165
8260M	Platinum	XCC	2.4	NA	24	2933	165
8260	Platinum	XCC	2.4	NA	24	2933	165
8256	Platinum	NA	3.8	NA	4	2933	105
8253	Platinum	XCC	2.2	NA	16	2933	125

Table 6. Processor HCC SKU stack

Intel SKU	SKU type	Stepping	Speed (GHz)	Cache (MB)	Cores	Max memory speed (MT/s)	TDP (W)
5115	Gold	HCC	2.4	NA	10	2666	85
5118	Gold	HCC	2.3	NA	12	2666	105
5120	Gold	HCC	2.2	NA	14	2666	105
5218N	Gold	HCC	2.3*	NA	16	2933	105
5217	Gold	HCC	3	NA	8	2933	125
5215	Gold	HCC	2.5	NA	10	2933	85
5215M	Gold	HCC	2.6	NA	10	2933	85
5215L	Gold	HCC	2.6	NA	10	2933	85

Chipset

The PowerEdge R840 systems use the Intel chipset that provides extensive I/O support. Functions and capabilities include:

- ACPI Power Management Logic Support, Revision 4.0a
- PCI Express Base Specification Revision 3.0
- Integrated Serial ATA host controller supports data transfer rates of up to 6 Gb/s on all ports.
- xHCI USB controller with SuperSpeed USB 3.0 ports
- Direct Media Interface
- Serial Peripheral Interface
- Enhanced Serial Peripheral Interface
- Flexible I/O - Allows some high-speed I/O signals to be configured as PCIe root ports, PCIe uplink for use with certain PCH SKUs, SATA (and sSATA), or USB 3.0.
- General Purpose Input Output (GPIO)
- Low Pin Count interface, interrupt controller, and timer functions
- System Management Bus Specification, Version 2.0

- Integrated Clock Controller/Real Time Clock Controller
- Intel High Definition Audio and Intel Smart Sound Technology
- Integrated 10/1 Gb Ethernet
- Integrated 10/100/1000 Mbps Ethernet MAC
- Supports Intel Rapid Storage Technology Enterprise
- Supports Intel Active Management Technology and Server Platform Services
- Supports Intel Server Platform Service firmware
- Supports Intel Virtualization Technology for Directed I/O
- Supports Intel Trusted Execution Technology
- JTAG Boundary Scan support
- Intel QuickAssist Technology
- Intel PCIe QuickAssist card
- Intel Trace Hub for debug

For more information, go to [Intel.com](https://www.intel.com)

System memory

Each CPU has 12 memory DIMM slots. Those DIMMs are organized into six different channels so there are 2 DIMMs per channel. For best performance all memory channels should be populated with the same number of DIMMs, either 6 or 12 DIMMs per CPU.

DIMM Type

There are four different types of DIMMs.

RDIMM:

Registered DIMM - Provides for higher capacity options and advanced RAS features. It is the most commonly used DIMM type, and offers the best mix of frequency, capacity, and rank structure choices.

LRDIMM:

Load Reduced DIMM - Provides maximum capacity beyond that of an RDIMM but at a higher power consumption. Uses a buffer to reduce memory loading to a single load on all DDR signals, allowing for greater density.

DCPMM (also known as **Intel Optane DC persistent memory**):

Provides a large memory capacity at an affordable price. Any application can take advantage of DCPMM in Memory Mode with a compatible operating system. Unlock more performance and persistency when using an application that supports App Direct Mode. DCPMM is used along with RDIMMs or LRDIMMs, and a maximum number of 6 DCPMMs can be used per CPU. This persistent memory technology does not require a battery.

NVDIMM

Non-Volatile DIMM - Provides a persistent memory solution with NAND and DRAM that maintains data in power loss, system crash, or normal shutdown. This solution requires a battery as a power source for an AC loss condition. It can be used along with RDIMMs.

Intel Optane DC Persistent Memory (DCPMM)

Intel® Optane™ DC Persistent Memory is a new memory technology that allows customers to reach a large memory capacity at an affordable price. Also, when operating the memory in "App Direct Mode" the memory is persistent.

DCPMM comes in 3 different memory sizes, 128 GB, 256 GB, and 512 GB.

RDIMMs and LRDIMMs are used along with Intel Optane DC persistent memory. Each channel is populated with up to one DIMM of DRAM and one DIMM of DCPMM. That means that each CPU has up to 6 DIMMs of DRAM and 6 DIMMs of DCPMM. For best performance, it is recommended to have all 12 DIMMs slots per CPU populated.

Intel Optane DC persistent memory operates in two modes, Memory Mode and Application Direct Mode.

Trait	Memory Mode	App Direct Mode
Application support	Any application	Application must state that it supports "App Direct Mode"
DRAM	Used as cache and is not available as system memory.	Both DCPMM and DRAM are available as system memory
Persistence	No	Yes

Memory Operating Modes

Performance Optimized or Optimizer Mode

Prioritizes performance and does not provide any RAS features beyond standard ECC (Error-Correcting Code).

Memory mirroring

Memory mirroring has two adjacent memory channels that are configured to write the same data to each channel. If one memory channel fails or encounters an error, the other channel continues to transmit data. It is an excellent safeguard for systems requiring uninterrupted operation, though it cuts memory capacity in half, doubles the cost per gigabyte, and can increase power consumption.

Fault resilient memory

Fault resilient memory is a Dell patented technology that works with the VMWare ESXi Hypervisor to provide a fault resilient zone that protects virtual machines from the ramifications of memory faults.

Memory sparing

can reduce downtime from correctable errors by allocating one rank (64-bit wide data area on a DIMM) per channel (Single Rank Spare Mode) or two ranks per channel (Multi Rank Spare Mode) as memory spares. If a correctable error occurs in a rank or channel, it is moved to the spare rank while the operating system is running. This prevents the error from causing a failure. Memory sparing reduces memory capacity by one rank per channel or two ranks per channel (depending if Single Rank or Multi Rank is selected) and can increase the cost per gigabyte.

DIMM Speed and Frequency

The following table lists the PowerEdge R840 memory speeds and CPU support:

Table 7. PowerEdge R840 memory speeds and CPU support

CPU family	DIMM type	DIMM ranking	Capacity	Speed (MT/s)
Intel Xeon Scalable	RDIMM	1R/2R	8 GB, 16 GB, and 32 GB	2666
2nd Generation Intel Xeon Scalable	RDIMM	1R	8 GB	2666
2nd Generation Intel Xeon Scalable	RDIMM	2R	16 GB, 32 GB, and 64 Gb	2933
Intel Xeon Scalable	LRDIMM	4R/8R	64 GB and 128 GB	2666
2nd Generation Intel Xeon Scalable	LRDIMM	8R	128GB	2666
2nd Generation Intel Xeon Scalable	DCPMM	N/A	128 GB, 256 GB, and 512 GB	2666
Intel Xeon Scalable or 2nd Generation Intel Xeon Scalable	NVDIMM	1R	16 GB	2666

Storage

The Dell PowerEdge R840 offer various internal and external storage controllers, drive types and different chassis and backplanes for varied numbers of drives. Features such as Express Flash PCIe SSDs, H740P and H840 Raid controller provide vastly accelerated performance over previous technologies. Dell Express Flash drives use PCIe lanes to connect directly to the processor and chipset and are easily accessible through a hot-plug drive bay.

Hard drive

The PowerEdge R840 system supports SAS, SATA or SSD hard drives.

Supported Drives

Table 8. Supported Drives - SAS, SATA or SSD

Form Factor	Type	Speed	Rotational Speed	Capacities
2.5 inch	SATA, SSD	6 Gb	N/A	240 GB, 400 GB, 480 GB, 800 GB, 960 GB, 1600 GB, 1920 GB, 3200 GB, 3840 GB, 7680GB
	SATA	6 Gb	7.2K	1 TB, 2 TB
	SAS	12 Gb	7.2K	1 TB, 2 TB, 2 TB(SED FIPS)
	SAS, SSD	12 Gb	N/A	400GB, 480GB, 800GB, 960GB, 1600GB, 1920GB, 3840GB, 800GB(SED FIPS), 1600GB(SED FIPS)
	SAS	12 Gb	10K	300GB, 600GB, 1.2 TB, 1.8 TB, 2.4 TB(P-RTS), 1.2 TB(SED FIPS), 2.4 TB (SED FIPS)
	SAS	12 Gb	15K	300 GB, 600 GB, 900 GB, 900 GB (SED FIPS)
Form Factor	Type	Capacities		
2.5 inch	NVMe	800 GB, 1600 GB, 3200 GB		
Card	NVMe	PM1725		

Topics:

- [PERC Controller](#)
- [IDSDM or vFlash module](#)
- [Optical Drives](#)
- [Tape Drives](#)
- [Boot Optimized Storage Subsystem](#)

PERC Controller

The Dell PowerEdge RAID Controller(PERC) family of enterprise-class controllers is designed for enhanced performance, increased reliability and fault tolerance, and simplified management. It provides a powerful, easy-to-manage way to create a robust infrastructure and help maximize system uptime.

The RAID controller options offer performance improvements, including the Mini PERC solution. Mini PERC provides a base RAID hardware controller without consuming a PCIe slot by using a small form factor and high-density connector to the system board.

The premium performance PERC controller drives better IOPs and enhanced SSD performance.

Table 9. PERC controller offerings

Performance level	Controller and description
Entry	S140 (SATA, NVMe) SW RAID SATA
Value	HBA330 (Internal), 12 Gbps SAS HBA (External), Memory: None, x8 12 Gb SAS, x8 PCIe 3.0 H330, 12 Gbps SAS HBA (External), Memory: None, x8 12 Gb SAS, x8 PCIe 3.0
Value performance	H730P, Memory: 2 GB, NV 72-bit, 866 MHz, x8 12 Gb SAS, x8 PCIe 3.0
Premiumperformance	H740P, Memory: 4/8 GB, NV 72-bit

IDSDM or vFlash module

The PowerEdge R840 system supports optional Internal Dual SD module (IDSDM) or vFlash module. In the latest generation of PowerEdge servers, IDSDM or vFlash module is combined into a single card module, and are available in these configurations:

- vFlash or
- vFlash and IDSDM

The IDSDM or vFlash module is located in a slot on the back of the system. The module supports three microSD cards; two cards for IDSDM and one card for vFlash. The following capacities are supported:

- IDSDM: 16 GB, 32 GB, 64 GB
- vFlash: 16 GB

NOTE: There are two dip switches on the IDSDM or vFlash module for write-protection.

NOTE: One IDSDM card slot is dedicated for redundancy.

NOTE: Use Dell branded microSD cards associated with the IDSDM or vFlash configured systems.

Optical Drives

The PowerEdge R840 supports one of the following internal optical drive options:

- DVD-ROM
- DVD+ROM

Tape Drives

The R840 do not support internal tape drives. However, external tape backup devices will be supported on R840.

Supported external tape drives:

- External RD1000 USB
- External LTO-5, LTO-6, LTO-7 and 6 Gb SAS tape drives
- 114X rack mount chassis with LTO-5, LTO-6, and LTO-7 6Gb SAS tape drives
- TL1000 with LTO-5, LTO-6, and LTO-7 6 Gb SAS tape drives
- TL2000 with LTO-5, LTO-6, and LTO-7 6 Gb SAS tape drives
- TL2000 with LTO-5, LTO-6, and LTO-7 8 Gb FC tape drives
- TL4000 with LTO-5, LTO-6, and LTO-7 6 Gb SAS tape drives
- TL4000 with LTO-5, LTO-6, and LTO-7 8Gb FC tape drives
- ML6000 with LTO-5, LTO-6, 6 Gb SAS tape drives
- ML6000 with LTO-5, LTO-6, LTO-7 8Gb FC tape drives

Boot Optimized Storage Subsystem

The Boot Optimized Storage Subsystem (BOSS) is offered as a means of booting PowerEdge systems to a full operating system mode when:

- Target operating system is a full operating system and not hypervisor that may be supported best by IDSDM
- You do not want to trade off standard hot plug drive slots for operating system install

The RAID controller on the BOSS card has limited set of features. This RAID controller presents the M.2 SATA SSDs as either a non-RAID volume or as a single RAID volume.

Networking and PCIe

The Dell EMC PowerEdge R840 offers offer balanced, scalable I/O capabilities, including integrated PCIe 3.0-capable expansion slots. Dell Select Network Adapters, Dell's network daughter cards, enable you to choose the right network fabric without using up a valuable PCI slot. Pick the speed, technology, vendor, and other options, such as switch independent partitioning, which enable you to share and manage bandwidth on 10GbE connections.

Topics:

- [Network daughter card](#)
- [PCIe Risers and slots](#)

Network daughter card

CAUTION: If the GPU card is installed, you cannot install the 10 GbE NDC.

PowerEdge R840 supports up to four Network Interface Controller (NIC) ports on the back panel, which are available in the following configurations:

- Four 1 Gbps
- Four 10 Gbps
- Two 10 Gbps and two 1 Gbps
- Two 25 Gbps

PCIe Risers and slots

PowerEdge R840 supports PCI express (PCIe) generation 3 expansion cards that can be installed on the system board using expansion card risers.

PCIe Expansion card riser

The following table provides detailed information about the expansion card riser specifications:

Table 10. Expansion card riser configurations

PCIe slots on the riser	Supported expansion cards	Processor 1		Processor 2	
		x16 PCIe riser 1	x8 PCIe riser 1	x16 PCIe riser 2	x8 PCIe riser 2
PCIe Slot-1	Half Height	NA	x8	NA	NA
PCIe Slot-2	Full Height - Half Length	NA	x8	NA	NA
	Full Height - Full Length	x16	NA	NA	NA
PCIe Slot-3 (On system board)	Low Profile - Half Length	x16	x16	NA	NA
PCIe Slot-4 (On system board)	Low Profile - Half Length	x16	NA	x16	x16
PCIe Slot-5	Full Height - Half Length	NA	NA	NA	x8
PCIe Slot-6	Full Height - Full Length	NA	NA	x16	NA
	Full Height - Half Length	NA	NA	NA	x8

NOTE: For more information on expansion card risers, see [Meeseeks PCIe Configuration Tool](#).

Trusted platform module

The Trusted Platform Module (TPM) is used to generate and store keys, protect or authenticate passwords, and create and store digital certificates. The Intel's TXT (Trusted Execution Technology) functionality along with Microsoft's Platform Assurance feature in Windows Server 2016 is supported. TPM can also be used to enable the BitLocker hard drive encryption feature in Windows Server 2012/2016.

The TPM chip is on the Plug-in Module (PIM) and bound only to one system board.

The system board has a connector for the plug-in module, and it is factory-installed.

There are four types of TPM module options:

- No TPM
- TPM 1.2 Nuvoton FIPS-CC-TCG
- TPM 2.0 Nuvoton FIPS-CC-TCG
- TPM 2.0 NationZ

Power, Thermal, and Acoustics

The lower overall system-level power draw is a result of the breakthrough system design developed by Dell EMC. The system aims to maximize performance per watt through a combination of energy efficient technologies, optimized thermal designs and intelligent fan control algorithms. The system fan control algorithms use an extensive array of sensors that automatically monitor power and thermal activity to minimize fan speeds based on system cooling requirements, reducing the power required for cooling.

Topics:

- [Power consumption and energy efficiency](#)
- [Power supply units](#)
- [Thermal and Acoustics](#)

Power consumption and energy efficiency

With the rise in the cost of energy coupled with increasing data center density, Dell EMC provides tools and technologies to help you realize greater performance with lower energy cost and wastage. More efficient data center usage can reduce costs by slowing the need for additional data center space. The following table lists the tools and technologies that Dell EMC offers to help you achieve your data center goals by lowering power consumption and increasing energy efficiency.

Table 11. Power tools and technologies

Feature	Description
Power supply units (PSU) portfolio	PSU portfolio includes intelligent features such as dynamically optimizing efficiency while maintaining availability and redundancy. For more information, see the <i>Power supply units</i> section.
Tools for right-sizing	Enterprise Infrastructure Planning Tool (EIPT) is a tool that helps you plan and tune your computer and infrastructure equipment for maximum efficiency by calculating hardware power consumption, power infrastructure and storage. Learn more at Dell.com/calc .
Power monitoring accuracy	PSU power monitoring improvements include: <ul style="list-style-type: none"> • Power monitoring accuracy of 1%, whereas the industry standard is 5% • More accurate reporting of power • Better performance under a power cap
Power capping	Use Dell EMC systems management tools such as OpenManage Power Center and iDRAC9 with an Enterprise license can be used to set a power limit for your server. This limits the output of a PSU and reduce system power consumption and help in constrained power situations.
Systems management	The integrated Dell Remote Access Controller 9 (iDRAC9) with Lifecycle Controller is embedded within every Dell EMC PowerEdge™ server and provides functionality that helps IT administrators deploy, update, monitor, and maintain servers with no need for any additional software to be installed. iDRAC functions regardless of operating system or hypervisor presence because from a pre-OS or bare-metal state, iDRAC is ready to work because it is embedded within each server from the factory.
Active power management	Dell EMC offers a complete power management solution accessed through the iDRAC9 with Enterprise licensing and OpenManage Power Center to implement policy-based management of power and thermal levels at the individual system, rack, or data center level. Hot spares reduce power consumption of redundant power supplies. Thermal control of fan speed optimizes the thermal settings for your environment to reduce fan consumption and lower system power consumption.

Power supply units

Energy Smart power supplies have intelligent features, such as the ability to dynamically optimize efficiency while maintaining availability and redundancy. Also featured are enhanced power-consumption reduction technologies, such as high-efficiency power conversion and advanced thermal-management techniques, and embedded power-management features including high-accuracy power monitoring. The system supports two hot-swappable AC power supplies with 1 + 1 redundancy, auto-sensing and auto-switching capability. A single cabled AC power supply option is also available for the R840.

Thermal and Acoustics

The system's thermal management delivers high performance through optimized cooling of components at the lowest fan speeds across a wide range of ambient temperatures from 10°C to 35°C (50°F to 95°F) and to extended ambient temperature ranges. These optimizations result in lower fan power consumption which translate to lower system power and data center power consumption.

Thermal design

The thermal design of the system reflects the following:

- **Optimized thermal design:** The system layout is architected for optimum thermal design. System component placement and layout are designed to provide maximum airflow coverage to critical components with minimal expense of fan power.
- **Comprehensive thermal management:** The thermal control system regulates the system fan speeds based on feedback from system component temperature sensors, as well as for system inventory and subsystem power draw. Temperature monitoring includes components such as processors, DIMMs, chipset, system inlet air ambient, hard disk drives, NDC, and GPU.
- **Open and closed loop fan speed control:** Open loop fan control uses system configuration to determine fan speed based on system inlet air temperature. Closed loop thermal control uses temperature feedback to dynamically adjust fan speeds based on system activity and cooling requirements.
- **User-configurable settings:** With the understanding and realization that every customer has a unique set of circumstances or expectations from the system, in this generation of servers, we have introduced limited user-configurable settings in the iDRAC9 BIOS setup screen. For more information, see the Dell EMC PowerEdge system Installation and Service Manual on Dell.com/Support/Manuals and “[Advanced Thermal Control: Optimizing across Environments and Power Goals](#)” on Dell.com.
- **Cooling redundancy:** The system allows N+1 fan redundancy, allowing continuous operation with one fan failure in the system.
- **Environmental Specifications:** The optimized thermal management makes the R840 reliable under a wide range of operating environments.

Acoustical design

Dell EMC focuses on sound quality in addition to sound power level and sound pressure level. Sound quality describes how disturbing or pleasing a sound is interpreted, and Dell EMC references a number of psychacoustical metrics and thresholds in delivering to it. Tone prominence is one such metric. Sound power and sound pressure levels increase with greater populations or higher utilization, while sound quality remains good even as the frequency content changes. A reference for comparison to sound pressure levels for familiar noise sources is given in the following table. An extensive description of Dell EMC Enterprise acoustical design and metrics is available in the [Dell Enterprise Acoustics](#) white paper.

Table 12. Acoustical reference points and output comparisons

Value measured at your ears		Equivalent familiar noise experience
LpA, dBA, re 20 µPa	Loudness, sones	
90	80	Loud concert
75	39	Data center, vacuum cleaner, voice must be elevated to be heard
60	10	Conversation levels
45	4	Whispering, open office layout, normal living room
35	2	Quiet office
30	1	Quiet library
20	0	Recording studio

Rack rails

The R840 system offers Stab-in/Drop-in sliding rails.

Sliding rails features summary

Sliding rails allow the system to be fully extended out of the rack for service. A strain relief bar (SRB) is provided with each rail kit to organize and secure cables exiting the back of the server.

NOTE: The cable management arm (CMA) is not available.

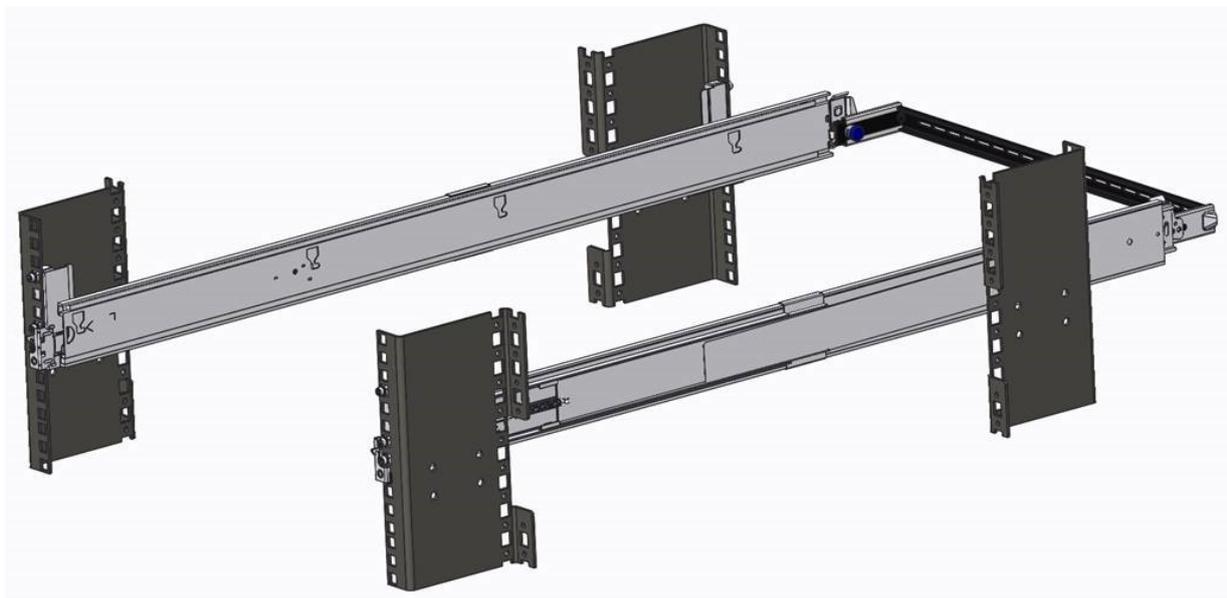


Figure 7. Sliding rails with SRB

Stab-in/Drop-in sliding rails for 4-post racks (New for 14G systems)

- Supports drop-in or stab-in installation of the chassis to the rails.
- Support for tool-less installation in 19 inch EIA-310-E compliant square hole (includes all generations of the Dell racks), unthreaded round hole, and threaded hole 4-post racks.
- Required for installing R840 in a Dell EMC Titan or Titan-D rack.
- Support full extension of the system out of the rack to allow serviceability of key internal components.
- Support for strain relief bar.
- Minimum rail mounting depth without the SRB: 852 mm.
- Minimum rail mounting depth with the SRB: 904 mm.
- Square-hole rack adjustment range: 560 - 930 mm.
- Round-hole rack adjustment range: 560 - 930 mm.
- Threaded-hole rack adjustment range: 560 - 930 mm.

Strain Relief Bar

- Tool-less attachment to rails.
- Two depth positions to accommodate various cable bundle sizes and rack depths.
- Supports cable weight and controls stresses on server connectors.
- Cables can be segregated into discrete, purpose specific bundles.

Dell EMC OpenManage systems management

Whether your IT environment consists of a few servers or a few thousand servers, Dell EMC OpenManage systems management solutions provide comprehensive management for evolving IT environments. OpenManage is based on open standards and provides agent-based and agent-free server lifecycle management functionality for Dell EMC PowerEdge servers. OpenManage solutions help you automate and streamline essential hardware management tasks.

Start with a firm foundation for efficient hardware management using OpenManage tools, utilities and management consoles. OpenManage systems management solutions consist of a combination of embedded management features and software products that help you automate and simplify the entire server lifecycle: deploy, update, monitor and maintain. OpenManage solutions are innovatively designed for simplicity and ease of use to help you reduce complexity, save time, achieve efficiency, control costs and empower productivity. OpenManage centers around efficient management of server lifecycle.

The Dell EMC OpenManage Portfolio

Simplifying hardware management through ease of use, intelligent automation and integrated security

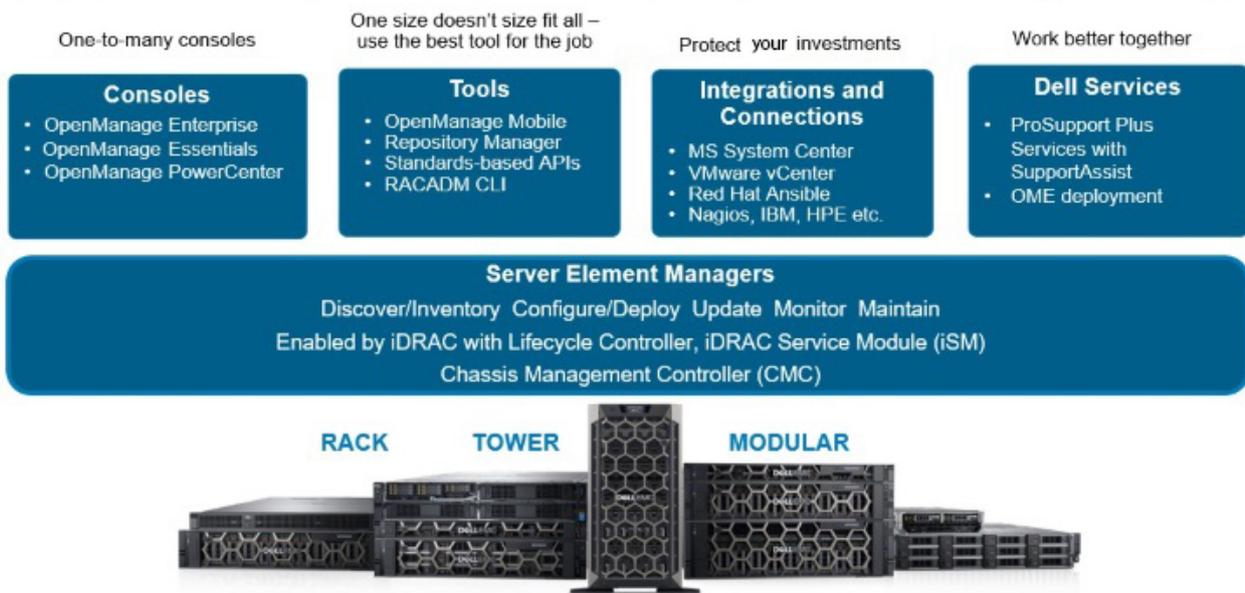


Figure 8. Server lifecycle management operations

Topics:

- OpenManage systems management
- iDRAC with Lifecycle controller
- Dell EMC consoles
- Dell EMC OpenManage systems management tools, utilities and protocols
- Integration with third-party consoles
- OpenManage connections with third-party consoles

OpenManage systems management

The Dell EMC OpenManage systems management portfolio includes powerful hardware and software management tools and consoles. OpenManage simplifies the lifecycle of deploying, updating, monitoring and maintaining your Dell EMC PowerEdge servers.

iDRAC with Lifecycle controller

The integrated Dell Remote Access Controller 9 (iDRAC9) with Lifecycle Controller is embedded within every Dell EMC PowerEdge server and provides functionality that helps IT administrators deploy, update, monitor, and maintain servers with no need for any additional software to be installed. iDRAC functions regardless of operating system or hypervisor presence because from a pre-OS or bare-metal state, iDRAC is ready to work because it is embedded within each server from the factory.

iDRAC features and comparison

The R840 supports the following iDRAC licenses – Basic (default), Express (upgrade) and Enterprise (upgrade).

i | **NOTE: The features listed in bold in the below table are new for iDRAC9.**

Table 13. iDRAC feature comparison

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Interface/Standards								
Redfish	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPMI 2.0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DCMI 1.5	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Web-based GUI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Racadm command line—local/remote	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SMASH-CLP—SSH-only	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSH	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Serial redirection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WSMAN	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Network Time Protocol	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Connectivity								
Shared NIC	Yes	Yes	Yes	Yes	N/A	N/A	Yes	Yes
Dedicated NIC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VLAN tagging	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPv4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPv6	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP (new default; no static IP)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP with Zero Touch	No	No	No	No	No	No	No	Yes
Dynamic DNS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OS pass-through	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
iDRAC Direct-Front panel USB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Connection View	No	Yes	No	Yes	No	Yes	No	Yes
NFS v4	No	Yes	No	Yes	No	Yes	No	Yes
NTLM v1 and NTLM v2	No	Yes	No	Yes	No	Yes	No	Yes
Security								

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Role-based authority	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local users	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSL encryption	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP blocking	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Directory services—AD, LDAP	No	No	No	No	No	No	Yes	Yes
Two-factor authentication	No	No	No	No	No	No	Yes	Yes
Single sign-on	No	No	No	No	No	No	Yes	Yes
PK authentication	No	No	Yes	Yes	Yes	Yes	Yes	Yes
FIPS 140-2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Secure UEFI boot-certificate management	No	Yes	No	Yes	No	Yes	No	Yes
Lock down mode	No		No	No	No	No	No	Yes
Unique iDRAC default password	No	Yes	No	Yes	No	Yes	No	Yes
Customizable Security Policy Banner-login page	No	Yes	No	Yes	No	Yes	No	Yes
Quick Sync 2.0-optional auth for read operations	No	Yes	No	Yes	No	Yes	No	Yes
Quick Sync 2.0-add mobile device number to LCL	No	Yes	No	Yes	No	Yes	No	Yes
Remote Presence								
Power control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Boot control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Serial-over-LAN	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual Media	No	No	No	No	Yes	Yes	Yes	Yes
Virtual Folders	No	No	No	No	No	No	Yes	Yes
Remote File Share	No	No	No	No	No	No	Yes	Yes
Virtual Console	No	No	No	No	Yes	Yes	Yes	Yes
HTML5 access to virtual console	No	No	No	No	Yes	Yes	Yes	Yes
VNC connection to OS	No	No	No	No	No	No	Yes	Yes
Quality/bandwidth control	No	No	No	No	No	No	Yes	Yes
Virtual Console collaboration—6 users	No	No	No	No	No	No	Yes	Yes
Virtual Console chat	No	No	No	No	No	No	Yes	Yes
Virtual Flash partitions	No	No	No	No	No	No	Yes	Yes
Group manager	No	No	No	No	No	No	No	Yes
HTTP/HTTPS support along with NFS/CIFS	No	Yes	No	Yes	No	Yes	No	Yes
Power and Thermal								
Real-time power meter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Power thresholds & alerts	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Real-time power graphing	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Historical power counters	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Power capping	No	No	No	No	No	No	Yes	Yes
Power Center integration	No	No	No	No	No	No	Yes	Yes
Temperature monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Temperature graphing	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Health Monitoring								
Predictive failure monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMPv1, v2 and v3—traps and gets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Email alerting	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Configurable thresholds	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fan monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Power Supply monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Memory monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CPU monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RAID monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NIC monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HD monitoring—enclosure	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Out of Band Performance Monitoring	No	No	No	No	No	No	Yes	Yes
Alerts for excessive SSD wear	No	Yes	No	Yes	No	Yes	No	Yes
Customizable settings for Exhaust Temperature	No	Yes	No	Yes	No	Yes	No	Yes
Update								
Remote agent-free update	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Embedded update tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sync with repository—scheduled updates	No	No	No	No	No	No	Yes	Yes
Auto update	No	No	No	No	No	No	Yes	Yes
Improved PSU firmware updates	No	Yes	No	Yes	No	Yes	No	Yes
Deployment and Configuration								
Local configuration via F10	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Embedded OS deployment tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Embedded configuration tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AutoDiscovery	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Remote OS deployment	No	No	Yes	Yes	Yes	Yes	Yes	Yes

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Embedded driver pack	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Full configuration inventory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inventory export	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remote configuration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zerotouch configuration	No	No	No	No	No	No	Yes	Yes
System Retire/Repurpose	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Server Configuration Profile in GUI	No	Yes	No	Yes	No	Yes	No	Yes
Diagnostics, Service and Logging								
Embedded diagnostic tools	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Part Replacement	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Server Configuration Backup	No	No	No	No	No	No	Yes	Yes
Server Configuration Restore	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Easy Restore—system configuration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Easy Restore Auto Timeout	No	Yes	No	Yes	No	Yes	No	Yes
LED health status indicator	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LCD screen—iDRAC9 requires optional bezel	Yes	Yes	Yes	Yes	N/A	N/A	Yes	Yes
Quick Sync—require NFC bezel (13 G only)	Yes	No	Yes	No	N/A	No	Yes	No
Quick Sync 2.0—requires BLE/WiFi hardware	No	Yes	No	Yes	No	N/A	No	Yes
iDRAC Direct—front USB mgmt port	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
iDRAC Service Module (iSM) embedded	No	Yes	No	Yes	No	Yes	No	Yes
iSM to inband alert forwarding to consoles	No	Yes	No	Yes	No	Yes	No	Yes
Crash screen capture	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Crash video capture	No	No	No	No	No	No	Yes	Yes
Boot capture	No	No	No	No	No	No	Yes	Yes
Manual reset for iDRAC—LCD ID button	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remote reset for iDRAC—requires iSM	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual NMI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
OS watchdog	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SupportAssist Report—embedded	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
System Event Log	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Features	iDRAC8 Basic	iDRAC9 Basic	iDRAC8 Express	iDRAC9 Express	iDRAC8 Express for Blades	iDRAC9 Express for Blades	iDRAC8 Enterprise	iDRAC9 Enterprise
Lifecycle Log	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced logging in the Lifecycle controller log	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Work notes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Remote Syslog	No	No	No	No	No	No	Yes	Yes
License management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Improved customer experience								
iDRAC -Faster processor, more memory	No	Yes	No	Yes	No	Yes	No	Yes
GUI rendered in HTML5	No	Yes	No	Yes	No	Yes	No	Yes
Add BIOS configuration to iDRAC GUI	No	Yes	No	Yes	No	Yes	No	Yes
iDRAC support for SW RAID licensing	No	Yes	No	Yes	No	Yes	No	Yes

Dell EMC consoles

The central console in a systems management solution is often referred to as the one-to-many console. The central console provides a rapid view and insight into the overall health of all systems in the IT environment. The Dell EMC systems management portfolio includes several powerful consoles, depending upon your needs, including the following:

OpenManage Enterprise

OpenManage Enterprise is the next generation of OpenManage Essentials. It simplifies, centralizes, and automates the full span of server lifecycle management activities. It helps in discovery, configuration, deployment, updates, and remediation. These tasks are performed within a single console that unifies management of tower, rack, and modular platforms. OpenManage Enterprise helps in standardizing and supporting IT management policies and practices.

The OpenManage Enterprise console simplifies and strengthens the current capability of OpenManage Essentials in the following areas:

- Reduced time and effort that is required to manage small and large-scale IT environments using HTML5 GUI
- Simplified GUI workflow to provide a single management layer that unifies the management of PowerEdge tower, rack, and modular platforms
- Packaged and delivered as virtual appliance and supports ESXi, HyperV, and KVM
- Redesigned architecture on CentOS with the PostgreSQL database. Operating system and database license are no longer required
- Centralized user management with role-based access control
- Enabled with customer automation and solution integration using Northbound API
- Enhanced policy-driven management

For more information, see www.dell.com/support/article/sln310714

OpenManage Mobile

OpenManage Mobile(OMM) is a software application that enables easy, convenient, and secure monitoring and management of PowerEdge servers remotely, or at-the-server. With OpenManage Mobile, IT Administrators can securely perform several data center monitoring and remediation tasks using an Android or iOS mobile device. The OpenManage Mobile app is available as a free software download from the Apple Store and the Google Play Store.

OMM can also monitor and manage PowerEdge servers through a OpenManage Enterprise or Essentials console or by directly accessing the server's iDRAC.

The OpenManage Enterprise or Essentials console can be accessed through OpenManage Mobile over a secure IP network. This enables you to monitor all devices managed by OpenManage Enterprise or Essentials such as Dell EMC servers, storage, networking, firewall, and supported third party devices.

If you are remote, you can access iDRAC over a secure IP network.

Key Features of OpenManage Mobile (When connected through OpenManage Enterprise or Essentials console):

- Connect to multiple servers which have OpenManage Enterprise installed, from a single mobile device.

- Connect to multiple servers individually through the iDRAC interface.
- Receive critical alert notification on your mobile device as they arrive into your OpenManage Enterprise management console.
- Acknowledge, forward, and delete alerts from your mobile device.
- Browse through device details, firmware inventory, and event logs of individual systems.
- Perform several server management functions such as power-on, power cycle, reboot, and shutdown from the mobile application.

Key Features of OpenManage Mobile (When connected through iDRAC):

- Connect to legacy PowerEdge servers remotely. For more information, see OpenManage Mobile compatibility matrix at dell.com/support
- Access rack, tower and modular servers through Quick Sync 2 modules or Quick Sync bezels as applicable.
- Assign IP address, change credentials, and update common BIOS attributes for Bare Metal Configuration
- Configure one server manually, or multiple servers simultaneously through a template.
- Browse server details, health status, hardware & firmware inventory, networking details, and System Event or LC logs. Share this information easily with other IT Administrators.
- Access SupportAssist reports, Last Crash screen and video (For more information, see OpenManage Mobile compatibility matrix at dell.com/support)
- Access Virtual Console (and reduce the need for crash carts).
- Power On, Shut down, or Reboot your server from anywhere.
- Run any RACADM command

OpenManage Power Center

OpenManage Power Center is a one-to-many application that can read power usage and thermal readings information from Dell EMC servers, Power Distribution Units (PDU), and Uninterruptible Power Supplies (UPS). It can aggregate this information into rack, row, and room-level views. On servers with iDRAC Enterprise license, you can also cap or throttle the power consumption. You may need to set power caps to reduce the power consumption due to external events such as brownouts or failures of data-center cooling devices. You can also use power capping to safely increase the numbers of servers in a rack to match the power that is provisioned for that rack.

For more information, see OpenManage Power Center User's Guide available at Dell.com/openmanagemanuals.

Dell EMC OpenManage systems management tools, utilities and protocols

Dell EMC OpenManage systems management tools and utilities consist of the following:

Dell EMC Repository Manager:

Dell EMC Repository Manager (DRM) is an application that helps you to:

- Identify the updates that are relevant to the systems in your data center.
- Identify and notify when updates are available.
- Package the updates into different deployment format.

To automate the creation of baseline repositories, DRM provides advanced integration capabilities with iDRAC/LC, OpenManage Essentials, Chassis Management Controller, OpenManage Integration for VMware vCenter and OpenManage Integration for Microsoft System Center (OMIMSSC). Also, DRM packages updates into custom catalogs that can be used for deployment.

Dell EMC Repository Manager can create the following deployment tools:

- Custom catalogs
- Lightweight deployment pack
- Bootable Linux ISO
- Custom Server Update Utility (SUU)

For more information, see Dell EMC Repository Manager User's Guide available at Dell.com/support/manuals.

Dell Update Packages

Dell Update Packages (DUP) is a self-contained executable supported by Microsoft Windows or Linux that updates a component on a server and applications like OMSA, iSM, and DSET.

DUPs can be executed in GUI or in CLI mode.

For more information, see Dell EMC Update Packages User's Guide available at www.delltechcenter.com/DSU.

Dell Remote Access Controller Administration (RACADM) CLI

The RACADM command-line utility provides a scriptable interface to perform inventory, configuration, update, and health status check of PowerEdge servers. RACADM operates in multiple modes:-

- Local — supports running RACADM commands from the managed server's operating system.
- SSH or Telnet — known as Firmware RACADM; is accessible by logging in to iDRAC using SSH or Telnet
- Remote — supports running RACADM commands from a remote management station such as a laptop or desktop.

RACADM is supported by the iDRAC with Lifecycle Controller and by the Chassis Management Controller of the M1000e, VRTX and FX2 modular systems. Local and Remote RACADM is supported on Windows Server, Windows clients, and on Red Hat, SuSe and Ubuntu Linux.

For more information, see the RACADM Command Line Reference Guide for iDRAC and CMC available at Dell.com/support/manuals.

iDRAC with Lifecycle Controller Embedded Management APIs

iDRAC with Lifecycle Controller provides a range of standards-based applications programming interfaces (APIs) that enable scalable and automated management of PowerEdge servers. Standard systems management APIs have been developed by organizations such as the Institute of Electrical and Electronics Engineers (IEEE) and Distributed Management Task Force (DMTF). These APIs are widely used by commercial systems management products and by custom programs and scripts developed by IT staff to automate management functions such as discovery, inventory, health status checking, configuration, update, and power management. The APIs supported by iDRAC with Lifecycle Controller include:

- **Redfish** - In 2015, the DMTF Scalable Platforms Management Forum published Redfish, an open industry-standard specification and schema designed to meet the needs of IT administrators for simple, modern, and secure management of scalable platform hardware. Dell is a key contributor to the Redfish standard, acting as co-chair of the SPMF, promoting the benefits of Redfish, and working to deliver those benefits within industry-leading systems management solutions. Redfish is a next generation management standard using a data model representation inside a hypermedia RESTful interface. The data model is defined in terms of a standard, machine-readable schema, with the payload of the messages expressed in JSON and the OData v4 protocol.
- **WSMan** -The Web Services For Management (WSMan) API, first published by the DMTF in 2008, is the most mature and robust API provided by iDRAC with Lifecycle Controller. WSMan uses a Simple Object Access Protocol (SOAP) with data modeled using the Common Information Model. WSMan provides interoperability between management applications and managed resources, and identifies a core set of web service specifications and usage requirements that expose a common set of operations central to all systems management.
- **IPMI** - The Intelligent Platform Management Interface (IPMI) is a message-based, hardware-level interface specification that can operate over both LAN and serial interfaces. IPMI is supported broadly by server vendors, systems management solutions, and open source software.
- **SNMP** - The Simple Network Management Protocol (SNMP) helps in standardizing the management of network devices. SNMP allows commercial management consoles created for monitoring network switches and routers to also monitor X86 servers. SNMP is primarily used to deliver event messages to alert administrators of problems on their systems but can also be used to discover, inventory and configure servers.

To assist automating system management tasks and simplify API integration, Dell provides PowerShell and Python libraries and script examples utilizing the WSMan interface. The iDRAC with LC pages of Dell Techcenter offer a library of technical white papers detailing the use of the embedded management APIs. For more information, see delltechcenter.com/iDRAC and delltechcenter.com/LC.

Integration with third-party consoles

Dell EMC OpenManage provides integration with several leading third-party consoles, including:

OpenManage Integration Suite for Microsoft System Center

The combination of Dell OpenManage Integration Suite and Microsoft System Center simplifies and enhances deployment, configuration, monitoring and updating of Dell servers and storage in physical and virtual environments. Our agent-free and agent-based plug-ins deliver a unique level of integration and efficiency when managing Dell hardware within a System Center environment.

The OpenManage Integration Suite for Microsoft System Center includes: Dell Server and Storage Management Packs for System Center Operations Manager (SCOM); Dell Server Deployment Packs and Update Catalogs for System Center Configuration Manager (SCCM); and tools for optimizing management of Dell PowerEdge servers in virtual environments using System Center Virtual Machine Manager (SCVMM).

OpenManage Integration for VMware vCenter

The OpenManage Integration for VMware vCenter allows you to monitor, provision, and manage PowerEdge server hardware and firmware. You can perform these tasks through a dedicated Dell menu that can be accessed directly through the VMware vCenter console. OMIVV also allows granular control and reporting for the hardware environment using the same role-based access control model as vCenter. The OpenManage Management Pack for vRealize Operations Manager is available with OMIVV v4.0 onwards. This helps in checking hardware health and alerting into vRealize operations, which also includes dashboard and reporting on the server environment.

You can manage and monitor Dell hardware within the virtualized environment

- Alerting and monitoring environment for servers and chassis
- Monitoring and reporting for servers and chassis
- Updating firmware on servers
- Deploying enhanced options

For more information, see delltechcenter.com/omivv

i **NOTE: The Dell EMC Repository Manager integrates with OpenManage Integration for VMware vCenter. The Dell EMC Repository Manager provides advanced functionality, simplifies the discovery, and deployment of new updates.**

BMC Software

Dell EMC and BMC Software work together to simplify IT by ensuring tight integration between Dell EMC server, storage, and network management functionality and the BMC Software process and data center automation products.

OpenManage connections with third-party consoles

Dell EMC OpenManage Connections gives you an easy path to adding support for third-party devices, so you can continue to use your existing management tools while easily adding Dell EMC server systems to your existing IT environment. Integrate new systems at your own pace. Manage new Dell EMC servers and storage with your legacy management tools, while extending the useful life of your existing resources. With OpenManage Connections you can add monitoring and troubleshooting of Dell EMC assets to your IT infrastructure.

- OpenManage Connection for Nagios Core and Nagios XI
- OpenManage Connection for HPE Operations Manager i (OMi)

For more information on these OpenManage Connections, visit Dell.com/openmanage.

Appendix A. Additional specifications

The following sections contain information about additional system specifications.

Topics:

- [PSU specifications](#)
- [Chassis dimensions](#)
- [Chassis weight](#)
- [Environmental specifications](#)
- [Video specifications](#)

PSU specifications

PowerEdge R840 supports up to two AC or DC power supply units (PSUs).

Table 14. PSU specifications

PSU	Class	Heat dissipation (maximum)	Frequency	Voltage	High line 200 V–240 V	Low line 100 V–140 V	DC	Current
750 W AC	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC, autoranging	750 W	750 W	NA	10 A-5 A
750 W AC	Titanium	2843 BTU/hr	50/60 Hz	200–240 V AC, autoranging	750 W	NA	NA	5 A
750 W Mixed Mode HVDC (for China only)	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC, autoranging	750 W	750 W	NA	NA
N/A	2891 BTU/hr	N/A	240 V DC, autoranging	NA	NA	750 W	4.5 A	
750 W Mixed Mode AC	Platinum	2891 BTU/hr	50/60 Hz	100–240 V AC, autoranging	750 W	750 W	NA	10 A-5 A
750 W Mixed Mode DC (for China only)	Platinum	2891 BTU/hr	N/A	240 V DC, autoranging	750 W	NA	750 W	5 A
1100 W AC	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC, autoranging	1100 W	1050 W	NA	12 A-6.5 A
1100 W DC	N/A	4416 BTU/hr	N/A	–(48–60) V DC, autoranging	NA	NA	1100 W	32 A
1100 W Mixed Mode HVDC (for China and Japan only)	Platinum	4100 BTU/hr	50/60 Hz	100–240 V AC, autoranging	1100 W	1050 W	NA	12 A-6.5 A
	N/A	4100 BTU/hr	N/A	200–380 V DC, autoranging	NA	NA	1100 W	6.4 A-3.2 A
1600 W AC	Platinum	6000 BTU/hr	50/60 Hz	100–240 V AC, autoranging	1600 W	800 W	NA	10 A
2000 W AC	Platinum	7500 BTU/hr	50/60 Hz	100–240 V AC, autoranging	2000 W	1000 W	NA	11.5 A
2400 W AC	Platinum	9000 BTU/hr	50/60 Hz	100–240 V AC, autoranging	2400 W	1400 W	NA	16 A

- ① **NOTE:** Heat dissipation is calculated using the PSU wattage rating.
- ① **NOTE:** This system is also designed to connect to the IT power system with a phase-to-phase voltage not exceeding 240 V.
- ① **NOTE:** To supply their rated capacity, PSUs rated for 1100 W AC or 1100 W Mixed Mode HVDC and higher require high-line voltage (200–240 V AC).

Chassis dimensions

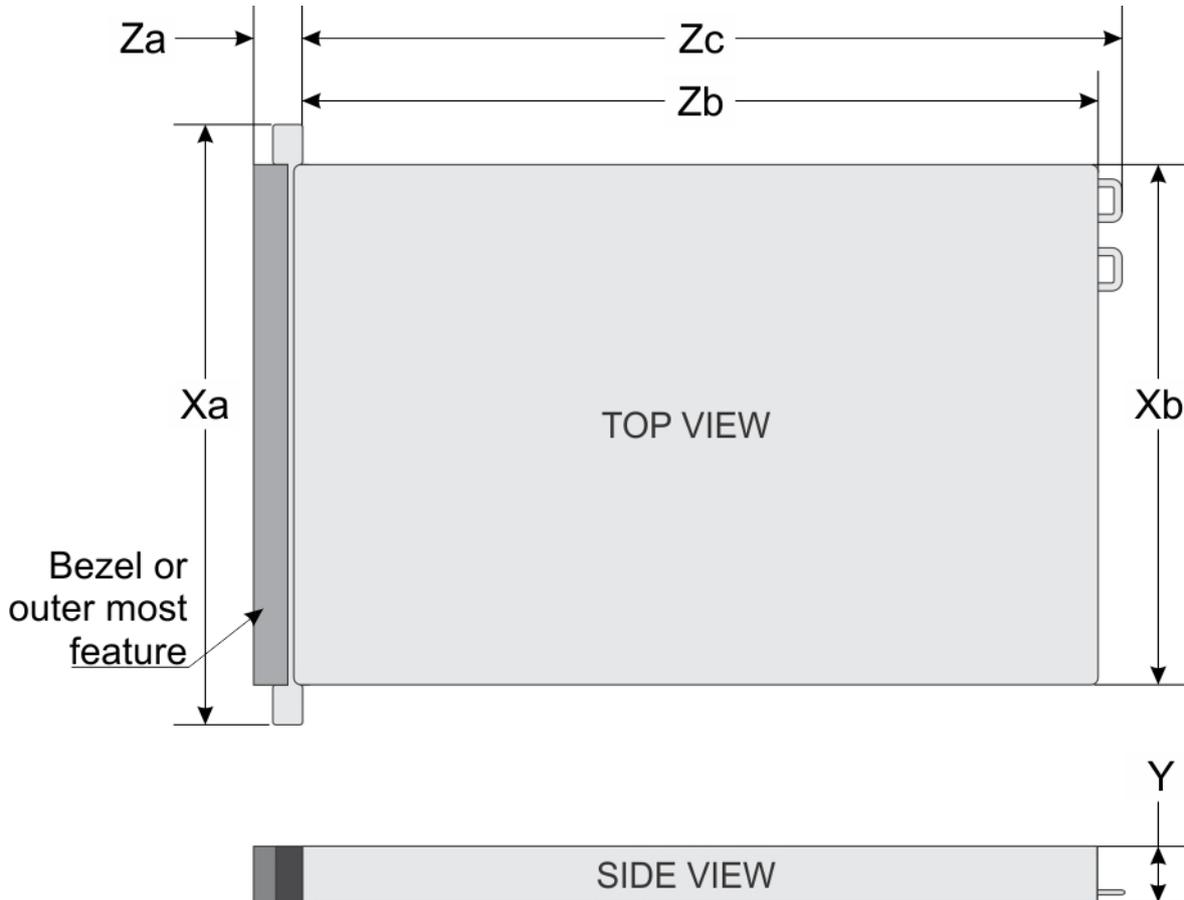


Figure 9. Dimensions of PowerEdge R840 system

Table 15. Dimensions of PowerEdge R840 system

Xa	Xb (without brackets)	Xb (w brackets)	Y	Za (with bezel)	Za (without bezel)	Zb	Zc (with PSU handle)	Zc (with chassis rear wall handle)
482 mm (18.97 inches)	434 mm (17.08 inches)	444.0 (17.48 inches)	86.8 mm (3.41 inches)	37.84 mm (1.41 inches)	23.9 mm (0.94 inches)	812 mm (31.96 inches)	842 mm (33.14 inches)	902 mm (35.51 inches)

- ① **NOTE:** Zb refers to the nominal rear wall external surface, where the system board I/O connectors are located.

Chassis weight

The following table shows the maximum weight of the R840 system:

Table 16. Chassis weight

System	Maximum weight (with all drives/SSDs)
2.5 inch	36.6 kg (80.68 lb)

Environmental specifications

See Dell EMC PowerEdge R840 installation service manuals on Dell.com/Support for detailed environmental specifications.

Video specifications

R840 servers support the integrated Matrox G200eW3 graphics controller with 16 MB of video frame buffer.

The following table describes the supported video resolution options.

Table 17. Supported video resolution options

Resolution	Refresh rate (Hz)	Color depth (bits)
1024 x 768	60	8, 16, 32
1280 x 800	60	8, 16, 32
1280 x 1024	60	8, 16, 32
1360 x 768	60	8, 16, 32
1440 x 900	60	8, 16, 32
1600 x 900	60	8, 16, 32
1600 x 1200	60	8, 16, 32
1680 x 1050	60	8, 16, 32
1920 x 1080	60	8, 16, 32
1920 x 1200	60	8, 16, 32

 **NOTE:** 1920 x 1080 and 1920 x 1200 resolutions are supported only in reduced blanking mode.

Appendix B. Standards compliance

Table 18. Industry standard documents

Standard	URL for information and specifications
ACPI Advance Configuration and Power Interface Specification, v2.0c	acpi.info
Ethernet IEEE 802.3-2005	standards.ieee.org/getieee802/802.3.html
HDG Hardware Design Guide Version 3.0 for Microsoft Windows Server	microsoft.com/whdc/system/platform/pcdesign/design/desguide/serverdg.mspx
IPMI Intelligent Platform Management Interface, v2.0	intel.com/design/servers/ipmi
DDR4 Memory DDR4 SDRAM Specification	jedec.org/standards-documents/docs/jesd79-4.pdf
PCI Express PCI Express Base Specification Rev. 2.0 and 3.0	pcisig.com/specifications/pciexpress
PMBus Power System Management Protocol Specification, v1.2	pmbus.info/specs.html
SAS Serial Attached SCSI, v1.1	t10.org
SATA Serial ATA Rev. 2.6; SATA II, SATA 1.0a Extensions, Rev. 1.2	sata-io.org
SMBIOS System Management BIOS Reference Specification, v2.7	dmtf.org/standards/smbios
TPM Trusted Platform Module Specification, v1.2 and v2.0	trustedcomputinggroup.org
UEFI Unified Extensible Firmware Interface Specification, v2.1	uefi.org/specifications
USB Universal Serial Bus Specification, Rev. 2.0	usb.org/developers/docs

Appendix C Additional resources

Table 19. Additional resources

Resource	Description of contents	Location
PowerEdge R840 Installation Service Manuals	<p>This manual, available in PDF format, provides the following information:</p> <ul style="list-style-type: none"> • Chassis features • System Setup program • System messages • System codes and indicators • System BIOS • Remove and replace procedures • Troubleshooting • Diagnostics • Jumpers and connectors 	Dell.com/Support/Manuals
PowerEdge R840 Getting Started Guide	<p>This guide ships with the system, and is also available in PDF format. This guide provides the following information:</p> <ul style="list-style-type: none"> • Initial setup steps • Key system features • Technical specifications 	Dell.com/Support/Manuals
Rack Installation Instructions	This document ships with the rack kits, and provides instructions for installing a server in a rack.	Dell.com/Support/Manuals
Information Update	This document ships with the system, is also available in PDF format online, and provides information on system updates.	Dell.com/Support/Manuals
System Information Label	The system information label documents the system board layout and system jumper settings. Text is minimized due to space limitations and translation considerations. The label size is standardized across platforms.	Inside the system chassis cover
Quick Resource Locator (QRL)	This code on the chassis can be scanned by a phone application to access additional information and resources for the server, including videos, reference materials, service tag information, and Dell contact information.	Inside the system chassis cover
Energy Smart Solution Advisor (ESSA)	The Dell online ESSA enables easier and more meaningful estimates to help you determine the most efficient configuration possible. Use ESSA to calculate the power consumption of your hardware, power infrastructure, and storage.	Dell.com/calc

Appendix D. Support and deployment services

ProDeploy Enterprise Suite and Residency Services

ProDeploy Enterprise Suite gets your server out of the box and into optimized production - fast. Our elite deployment engineers with broad and deep experience utilizing best-in-class processes along with our established global scale can help you around the clock and around the globe. From simple to the most complex server installations and software integration, we take the guess work and risk out of deploying your new server technology. Who's better suited to implement the latest Dell EMC servers than the Dell EMC elite deployment engineers who do it every day?

		Basic Deployment	ProDeploy	ProDeploy Plus
Pre-deployment	Single point of contact for project management		●	In-region
	Site readiness review		●	●
	Implementation planning		●	●
	Technology Service Manager (TSM) engagement for ProSupport Plus entitled devices			●
Deployment	Deployment service hours	Business hours	24x7	24x7
	Onsite hardware installation*	●	●	●
	Packaging materials disposal	●	●	●
	Install and configure system software		●	Onsite
Post-deployment	Project documentation with knowledge transfer		●	●
	Deployment verification		●	●
	Configuration data transfer to Dell EMC technical support		●	●
	30-days of post-deployment configuration assistance			●
	Training credits for Dell EMC Education Services			●

Figure 10. ProDeploy Enterprise Suite capabilities

NOTE: Hardware installation not applicable on selected software products.

ProDeploy Plus

From beginning to end, ProDeploy Plus provides the skill and scale needed to successfully execute demanding deployments in today's complex IT environments. Certified Dell EMC experts start with extensive environmental assessments and detailed migration planning and recommendations. Software installation includes set up of most versions of Dell EMC SupportAssist and OpenManage system management utilities. Post-deployment configuration assistance, testing, and product orientation help you rest easy knowing your systems have been deployed and integrated by the best.

ProDeploy

ProDeploy provides full service installation and configuration of both server hardware and system software by certified deployment engineers including set up of most versions of Dell EMC SupportAssist and OpenManage system management utilities. To prepare for the deployment, we conduct a site readiness review and implementation planning. System testing, validation and full project documentation with knowledge transfer complete the process. We focus on getting you up and running so you can focus on your business and prepare for whatever comes next.

Basic Deployment

Basic Deployment delivers worry-free professional installation of your servers by experienced technicians who know Dell EMC servers inside and out.

Residency Services

Residency helps customers transition to new capabilities quickly through on-site or remote Dell EMC experts whose priorities and time you control. Residency experts can provide post implementation management and knowledge transfer related to a new technology acquisition or day-to-day operational management of the IT infrastructure.

Deployment services

Deployment services details and exceptions can be found in service description documents at the Enterprise Configuration and Deployment page on Dell.com.

Remote Consulting Services

When you are in the final stages of your PowerEdge server implementation, you can rely on Dell EMC Remote Consulting and our certified technical experts to help you optimize your configuration with best practices for your software, virtualization, server, storage, networking, and systems management.

Data Migration Service

Protect your business and data with our single point of contact to manage your data migration project. Your project manager will work with our experienced team of experts to create a plan using industry-leading tools and proven processes based on global best practices to migrate your existing files and data, so your business system get up and running quickly and smoothly.

ProSupport Enterprise Suite

With Dell EMC ProSupport Services, we can help you keep your operation running smoothly, so you can focus on running your business. We will help you maintain peak performance and availability of your most essential workloads. Dell EMC ProSupport is a suite of support services that enable you to build the solution that is right for your organization. Choose support models based on how you use technology and where you want to allocate resources. From the desktop to the data center, address everyday IT challenges, such as unplanned downtime, mission-critical needs, data and asset protection, support planning, resource allocation, software application management and more. Optimize your IT resources by choosing the right support model.

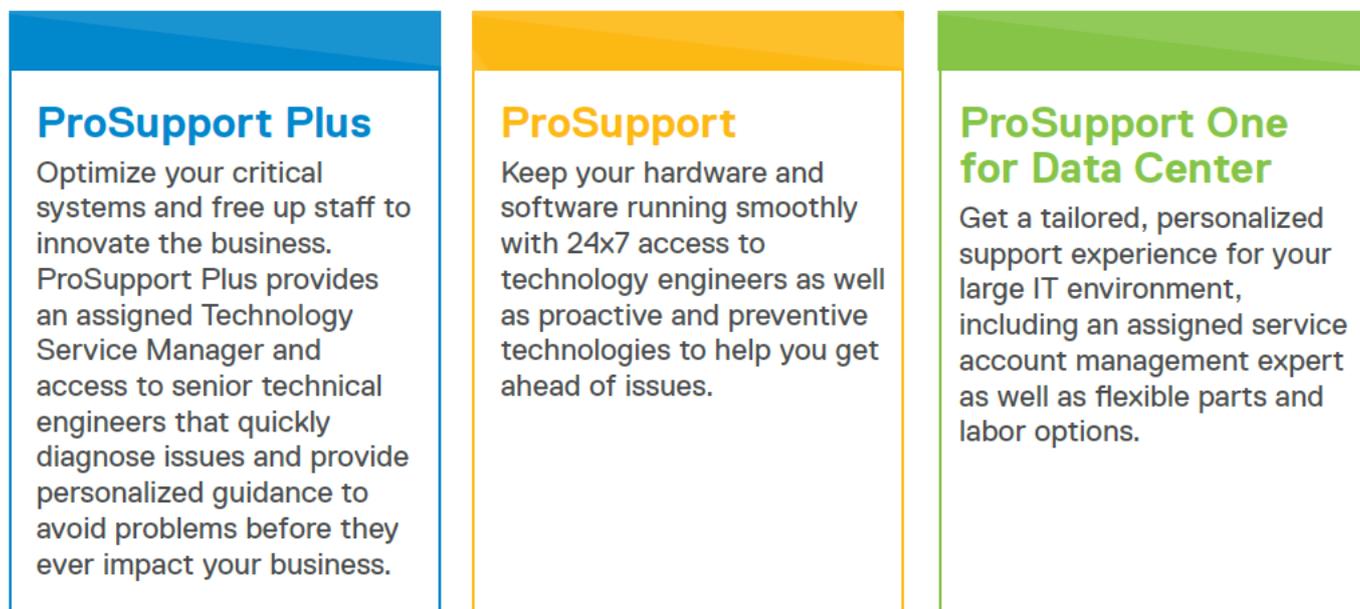


Figure 11. ProSupport Enterprise Suite

ProSupport Plus

When you purchase your PowerEdge server, we recommend ProSupport Plus, our proactive and preventative support for your business-critical systems. ProSupport Plus provides you with all the benefits of ProSupport, plus the following:

- A designated Technology Service Manager who knows your business and your environment
- Access to senior ProSupport engineers for faster issue resolution
- Personalized, preventive recommendations based on analysis of support trends and best practices from across the Dell EMC customer base to reduce support issues and improve performance
- Predictive analysis for issue prevention and optimization enabled by SupportAssist
- Proactive monitoring, issue detection, notification and automated case creation for accelerated issue resolution enabled by SupportAssist
- On-demand reporting and analytics-based recommendations enabled by SupportAssist and TechDirect

ProSupport

Our ProSupport service offers highly trained experts around the clock and around the globe to address your IT needs. We will help you minimize disruptions and maximize availability of your PowerEdge server workloads with:

- 24x7x365 access to certified hardware and software experts
- Collaborative 3rd party support
- Hypervisor and OS support
- Consistent level of support available for Dell EMC hardware, software and solutions
- Onsite parts and labor response options including next business day or four-hour mission critical

ProSupport One for Data Center

ProSupport One for Data Center offers flexible site-wide support for large and distributed data centers with more than 1,000 assets. This offering is built on standard ProSupport components that leverage our global scale but are tailored to your company's needs. While not for everyone, it offers a truly unique solution for Dell EMC's largest customers with the most complex environments.

- Team of designated Technology Services Managers with remote, on-site options
- Designated ProSupport One technical and field engineers who are trained on your environment and configurations
- On-demand reporting and analytics-based recommendations enabled by SupportAssist and TechDirect
- Flexible on-site support and parts options that fit your operational model
- A tailored support plan and training for your operations staff

	ProSupport	ProSupport Plus	ProSupport One for Data Center
Remote technical support	24x7	24x7	24x7
Parts and labor response options	Next business day or Mission Critical	Next business day or Mission Critical	Flexible
Automated issue detection and case creation	●	●	●
Self-service case initiation and management	●	●	●
Hypervisor and OS support	●	●	●
Priority access to specialized support experts		●	●
Designated Technology Service Manager		●	●
Personalized assessments and recommendations		●	●
On-demand support and utilization reports		●	●
Systems Maintenance guidance		Semiannual	Optional
Designated technical and field support teams			●

Figure 12. ProSupport One for Data Center model

Support Technologies

Powering your support experience with predictive, data-driven technologies.

SupportAssist

The best time to solve a problem is before it happens. The automated proactive and predictive technology SupportAssist* helps reduce your steps and time to resolution, often detecting issues before they become a crisis. Benefits include:

- Value - SupportAssist is available to all customer at no additional charge.
- Improve productivity - replace manual, high-effort routines with automated support.
- Accelerate time to resolution - receive issue alerts, automatic case creation and proactive contact from Dell EMC experts.
- Gain insight and control - optimize enterprise devices with on-demand ProSupport Plus reporting in TechDirect and get predictive issue detection before the problem starts.

SupportAssist is included with all support plans but features vary based on service level agreement.

	Basic Hardware Warranty	ProSupport	ProSupport Plus
Automated issue detection and system state information collection	•	•	•
Proactive, automated case creation and notification		•	•
Predictive issue detection for failure prevention			•
Recommendation reporting available on-demand in TechDirect			•

Figure 13. SupportAssist model

Get started at Dell.com/SupportAssist

TechDirect

Boost your IT teams productivity when supporting Dell EMC systems. With over 1.4 million self-dispatches processed each year, TechDirect has proven its effectiveness as a support tool. You can:

- Self-dispatch replacement parts
- Request technical support
- Integrate APIs into your help desk

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Additional professional services

Dell Education Services

Dell Education Services offers the PowerEdge server training courses designed to help you achieve more with your hardware investment. The curriculum is designed in conjunction with the server development team, as well as Dell EMC's technical support team, to ensure that the training delivers the information and practical, hands-on skills you and your team need to confidently manage and maintain your Dell EMC server solution. To learn more or register for a class today, visit LearnDell.com/Server.

Dell EMC Global Infrastructure Consulting Services

Dell EMC Global Infrastructure Consulting Services use skilled solution architects, innovative tools, automated analysis and Dell EMC's intellectual property to give you rapid insight into the root causes of unnecessary complexity. We seek better answers than traditional service models, and our strategy is to help you quickly identify high-impact, short-duration projects that deliver return on investment (ROI)

and free up resources. The results are practical, action-oriented plans with specific, predictable, measurable outcomes. From data center optimization to server virtualization to systems management, our consulting services can help you build a more efficient enterprise.

Dell EMC Managed Services

Dell EMC Managed Services are a modular set of lifecycle services designed to help you automate and centrally configure, deploy, and manage your day-to-day data center operations. These services extend your existing on-premise IT infrastructure with off-premise cloud services designed to better address challenges with mobility, highly distributed organizations, security, compliance, business continuity, and disaster preparedness.